CLAIMS

1   1.   An apparatus comprising:

2   at least one processor;

3   a memory coupled to the at least one processor; and

4   an optimizer residing in the memory and executed by the at least one processor,

5   the optimizer analyzing an expression and generating from the expression a graph that

6   includes at least one node, the optimizer generating from the graph an execution plan for

7   the expression, the execution plan comprising a plurality of execution plans that

8   correspond to different portions of the graph.

1   2.   The apparatus of claim 1 wherein the plurality of execution plans are appended to

2   corresponding nodes in the graph.

1   3.   The apparatus of claim 1 wherein the optimizer generates a new execution plan

2   for the query by changing at least one of the plurality of execution plans, and by using an

3   existing execution plan for each portion of the graph that is unaffected by the change.

1   4.   The apparatus of claim 1 wherein the graph further comprises a plurality of

2   relations and a plurality of expressions.

1   5.   An apparatus comprising:

2   at least one processor;

3   a memory coupled to the at least one processor;

4   a database residing in the memory;

5   a database query optimizer residing in the memory and executed by the at least

6 one processor, the database query optimizer processing a query to the database, the

7 database query optimizer comprising:

8   a graph builder that generates from the query a graph that includes at least

9   one node; and

10   an execution plan generator that generates from the graph an execution

11   plan for the query, the execution plan comprising a plurality of execution plans

12   that correspond to different portions of the graph.

1   6.   The apparatus of claim 5 wherein the execution plan generator appends the

2 plurality of execution plans to corresponding nodes in the graph.

1   7.   The apparatus of claim 5 wherein the execution plan generator generates a new

2 execution plan for the query by changing at least one of the plurality of execution plans,

3 and by using an existing execution plan for each portion of the graph that is unaffected by

4 the change.

1   8.   The apparatus of claim 5 wherein the graph further comprises a plurality of

2 relations and a plurality of expressions in the query.

1   9.   The apparatus of claim 5 wherein the optimizer compares a plurality of execution

2 plans that each functionally represent the query to estimate which of the plurality of

3 execution plans will be executed in the least amount of time.

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1   10.   A method for evaluating an expression comprising the steps of:

2   reading the expression;

3   generating from the expression a graph that includes at least one node;

4   generating from the graph an execution plan for the expression, the execution plan

5   comprising a plurality of execution plans that correspond to different portions of the

6   graph.

1   11.   The method of claim 10 further comprising the step of appending the plurality of

2   execution plans to corresponding nodes in the graph.

1   12.   The method of claim 10 further comprising the step of generating a new execution

2   plan for the query by performing the steps of:

3   changing at least one of the plurality of execution plans; and

4   using an existing execution plan for each portion of the graph that is unaffected by

5   the change.

1   13.   The method of claim 10 further comprising the step of comparing a plurality of

2   execution plans that each functionally represent the query to determine which of the

3   plurality of execution plans will likely be executed in the least amount of time.

1 14. A program product comprising:

2 (A) an optimizer that analyzes an expression and generates from the expression a

3 graph that includes at least one node, the optimizer generating from the graph an

4 execution plan for the expression, the execution plan comprising a plurality of execution

5 plans that correspond to different portions of the graph; and

6 (B) computer-readable signal bearing media bearing the optimizer.

1 15. The program product of claim 14 wherein the computer-readable signal bearing

2 media comprises recordable media.

1 16. The program product of claim 14 wherein the computer-readable signal bearing

2 media comprises transmission media.

1 17. The program product of claim 14 wherein the optimizer appends the plurality of

2 execution plans to corresponding nodes in the graph.

1 18. The program product of claim 14 wherein the optimizer generates a new

2 execution plan for the query by changing at least one of the plurality of execution plans,

3 and by using an existing execution plan for each portion of the graph that is unaffected by

4 the change.

1 19. The program product of claim 14 wherein the graph further comprises a plurality

2 of relations and a plurality of expressions.

1   20.   The program product of claim 14 wherein the optimizer compares a plurality of

2   execution plans that each functionally represent the expression to estimate which of the

3   plurality of execution plans will be executed in the least amount of time.

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